



LINCOLN-WOODSTOCK COOPERATIVE SCHOOL DISTRICT COURSE SYLLABUS

Course Name: Grade 6 Science

Semester: Full Year

Teacher: J. Wilson

Course Description:

[Grade 6 Science](#) is the first course in a 3-year integrated middle school curriculum. Students will develop science skills as well as study content in life science, physical science and earth and space science throughout the 3 years they spend in middle school. Attempts have been made to vertically align grades 6-8 so as to cover all of the NGSS MS Science Standards by the end of grade 8.

NGSS Standards Assessed:

Matter and Its Interactions

PS1-1: atomic composition, structure, and properties of matter

PS1-2: properties & chem reactions

PS1-4: states of matter & thermal energy

PS 1-5: chemical reactions preserve atoms

PS1-6: applied energy transfer

From Molecule to Organisms: Structure and Processes

LS1-1: cell theory

LS1-2: cell as system, organelles

LS1-3: body as interacting systems, organs (focus on organ systems not covered in grade 7)

LS1-1 & LS1-2: revisit/review

LS1-3: body as interacting systems, organs

Motion and Stability: Forces and Interactions

PS2-1: Newton's 3rd Law

PS2-2: Newton's 1st & 2nd Laws

PS2-3: electric and magnetic forces

PS2-5: objects can exert forces upon other objects even when not in contact

Energy

PS3-1: kinetic energy

PS3-2: potential energy

PS3-3: thermal energy

PS3-4: applied energy transfer

PS3-5: energy transfer

Earth's Systems, and Earth and Human Activity

ESS2-5: Earth's systems

ESS2-6: climate

ESS3-5: climate change



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Cross-Cutting Concepts

- Patterns
- Cause & Effect
- Scale, Proportion & Quantity
- Systems & System Models
- Energy & Matter
- Structure & Function
- Stability & Change

Science and Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Anchor Texts or Major Curriculum: Grade 6 uses *Amplify Science* for the following units: Microbiome, Metabolism, Metabolism Engineering Internship, and Ocean, Atmosphere, & Climate. All other units have been created by the grade 6 teacher, J. Wilson.



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Course Outline (major units of study):	
Unit Title	Essential Question or Overarching Understanding
<p>Matter and Its Interactions</p> <ul style="list-style-type: none">• <i>States of matter and phase change</i>• <i>Atoms, elements, and molecules</i>• <i>Chemical reactions</i>	<p>What is matter, and why are there different types of matter?</p> <ul style="list-style-type: none">• <i>All matter is made up of atoms, and different arrangements of atoms create different elements with distinct properties, states of matter, phase changes, and conservation of matter.</i>• <i>Reacting substances rearrange to form different molecules, but the number of atoms is conserved.</i>• <i>Some reactions release energy, and others absorb energy.</i>
<p>Energy</p> <ul style="list-style-type: none">• <i>Thermal energy</i>• <i>Kinetic energy</i>• <i>Potential energy</i>	<p>How is energy transferred and transformed to different forms, and how does it impact the motion, temperature, and behavior of objects in a system?</p> <p>Why do things change temperature?</p> <ul style="list-style-type: none">• <i>Energy can not be created or destroyed in a closed system, but it can be converted from one form to another.</i>• <i>Energy can be moved from place to place by moving objects, or through sound, light, or electrical currents.</i>• <i>Moving objects contain kinetic energy, and there are various forms of potential energy.</i>• <i>The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter.</i>
<p>Force & Motion</p> <ul style="list-style-type: none">• <i>Types of forces, balanced and unbalanced</i>• <i>Newton's Laws of Motion</i>• <i>Gravity</i>	<p>What causes motion, and what are the different types of forces that can cause it?</p> <ul style="list-style-type: none">• <i>Newton's 3 Laws of Motion predict the movement of all objects on Earth.</i>• <i>The effect of unbalanced forces on an object results in a change of motion. When two objects interact, each one exerts a force on the other, and these forces can transfer energy between them. Some forces act through contact, and other forces act even when the objects are not in contact.</i>• <i>The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.</i>



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Force and Motion Engineering Internship	How can I design a cardboard arcade game that uses one or more simple machines to create an unbalanced force?
The Cell	How do cells function as the building blocks of life, and how do they work together to form tissues, organs, and organ systems in living organisms?
Microbiome	How can having 100 trillion microorganisms on and in the human body keep us healthy?
Metabolism	<p>How do the trillions of cells in the human body get what they need to function, and what do the cells do with the things they absorb?</p> <ul style="list-style-type: none"> • <i>Within an individual organism, food is broken down through a series of chemical reactions that rearrange molecules and release energy used for growth and repair.</i>
Metabolism EI	How can I design an energy bar that tastes good, is cost-effective, and meets the needs of rescue workers and patients affected by a natural disaster?
Ocean, Atmosphere, & Climate	<p>What determines the air temperature of a location on Earth?</p> <ul style="list-style-type: none"> • <i>Water cycles among land, ocean, and atmosphere, and is propelled by sunlight and gravity. Density variations in seawater drive interconnected ocean currents.</i> • <i>Water movement causes weathering and erosion, changing landscape features.</i> • <i>Climate describes patterns of typical weather conditions over different scales and variations.</i>
Engineering Design Process	<i>How can I design a life vest for a Corgi to keep it safe as it swims in the water?</i>

Portrait of a Learner

Independent Learner

I make thoughtful plans and do my best to reach personal goals using feedback to work through challenges.

Responsible Collaborator

I work with others to achieve shared goals by listening actively, contributing ideas, and managing conflict.



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Critical Thinker

I analyze information, ask thoughtful questions, and apply reasoning skills to solve problems and make decisions.

Effective Communicator

I express ideas clearly, adapting strategies based on the audience, setting, and/or purpose.

Global Citizen

I show that I care and take responsibility by helping in my community and the world around me.

Additional Classroom Expectations:

- Students must participate in lab safety lessons, pass a lab safety quiz, and practice lab safety habits whenever in the science classroom.
- Students will participate in lab investigations and other hands-on activities, and keep a record of their science investigations in a lab notebook.
- Students will abide by the [expectations](#) for this course.